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## NOTICE OF ALLOWANCE AND FEE(S) DUE

22428 7590 04/06/2010

FOLEY AND LARDNER LLP  
SUITE 500  
3000 K STREET NW  
WASHINGTON, DC 20007

EXAMINER

SWOPE, SHERIDAN

ART UNIT

PAPER NUMBER

1652

DATE MAILED: 04/06/2010

APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/580,458	05/24/2006	William Vainchenker	065691-0445	1466

TITLE OF INVENTION: IDENTIFICATION OF A JAK2 MUTATION INVOLVED IN VAQUEZ POLYGLOBULIA

APPLN. TYPE	SMALL ENTITY	ISSUE FEE DUE	PUBLICATION FEE DUE	PREV. PAID ISSUE FEE	TOTAL FEE(S) DUE	DATE DUE
nonprovisional	NO	\$1510	\$0	\$0	\$1510	07/06/2010

**THE APPLICATION IDENTIFIED ABOVE HAS BEEN EXAMINED AND IS ALLOWED FOR ISSUANCE AS A PATENT. PROSECUTION ON THE MERITS IS CLOSED. THIS NOTICE OF ALLOWANCE IS NOT A GRANT OF PATENT RIGHTS. THIS APPLICATION IS SUBJECT TO WITHDRAWAL FROM ISSUE AT THE INITIATIVE OF THE OFFICE OR UPON PETITION BY THE APPLICANT. SEE 37 CFR 1.313 AND MPEP 1308.**

**THE ISSUE FEE AND PUBLICATION FEE (IF REQUIRED) MUST BE PAID WITHIN THREE MONTHS FROM THE MAILING DATE OF THIS NOTICE OR THIS APPLICATION SHALL BE REGARDED AS ABANDONED. THIS STATUTORY PERIOD CANNOT BE EXTENDED. SEE 35 U.S.C. 151. THE ISSUE FEE DUE INDICATED ABOVE DOES NOT REFLECT A CREDIT FOR ANY PREVIOUSLY PAID ISSUE FEE IN THIS APPLICATION. IF AN ISSUE FEE HAS PREVIOUSLY BEEN PAID IN THIS APPLICATION (AS SHOWN ABOVE), THE RETURN OF PART B OF THIS FORM WILL BE CONSIDERED A REQUEST TO REAPPLY THE PREVIOUSLY PAID ISSUE FEE TOWARD THE ISSUE FEE NOW DUE.**

### HOW TO REPLY TO THIS NOTICE:

I. Review the SMALL ENTITY status shown above.

If the SMALL ENTITY is shown as YES, verify your current SMALL ENTITY status:

A. If the status is the same, pay the TOTAL FEE(S) DUE shown above.

B. If the status above is to be removed, check box 5b on Part B - Fee(s) Transmittal and pay the PUBLICATION FEE (if required) and twice the amount of the ISSUE FEE shown above, or

If the SMALL ENTITY is shown as NO:

A. Pay TOTAL FEE(S) DUE shown above, or

B. If applicant claimed SMALL ENTITY status before, or is now claiming SMALL ENTITY status, check box 5a on Part B - Fee(s) Transmittal and pay the PUBLICATION FEE (if required) and 1/2 the ISSUE FEE shown above.

II. PART B - FEE(S) TRANSMITTAL, or its equivalent, must be completed and returned to the United States Patent and Trademark Office (USPTO) with your ISSUE FEE and PUBLICATION FEE (if required). If you are charging the fee(s) to your deposit account, section "4b" of Part B - Fee(s) Transmittal should be completed and an extra copy of the form should be submitted. If an equivalent of Part B is filed, a request to reapply a previously paid issue fee must be clearly made, and delays in processing may occur due to the difficulty in recognizing the paper as an equivalent of Part B.

III. All communications regarding this application must give the application number. Please direct all communications prior to issuance to Mail Stop ISSUE FEE unless advised to the contrary.

**IMPORTANT REMINDER: Utility patents issuing on applications filed on or after Dec. 12, 1980 may require payment of maintenance fees. It is patentee's responsibility to ensure timely payment of maintenance fees when due.**

## PART B - FEE(S) TRANSMITTAL

Complete and send this form, together with applicable fee(s), to: **Mail Stop ISSUE FEE**  
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**INSTRUCTIONS:** This form should be used for transmitting the ISSUE FEE and PUBLICATION FEE (if required). Blocks 1 through 5 should be completed where appropriate. All further correspondence including the Patent, advance orders and notification of maintenance fees will be mailed to the current correspondence address as indicated unless corrected below or directed otherwise in Block 1, by (a) specifying a new correspondence address; and/or (b) indicating a separate "FEE ADDRESS" for maintenance fee notifications.

CURRENT CORRESPONDENCE ADDRESS (Note: Use Block 1 for any change of address)

22428 7590 04/06/2010

**FOLEY AND LARDNER LLP**  
**SUITE 500**  
**3000 K STREET NW**  
**WASHINGTON, DC 20007**

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### Certificate of Mailing or Transmission

I hereby certify that this Fee(s) Transmittal is being deposited with the United States Postal Service with sufficient postage for first class mail in an envelope addressed to the **Mail Stop ISSUE FEE** address above, or being facsimile transmitted to the USPTO (571) 273-2885, on the date indicated below.

(Depositor's name)

(Signature)

(Date)

APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/580,458	05/24/2006	William Vainchenker	065691-0445	1466

TITLE OF INVENTION: IDENTIFICATION OF A JAK2 MUTATION INVOLVED IN VAQUEZ POLYGLOBULIA

APPLN. TYPE	SMALL ENTITY	ISSUE FEE DUE	PUBLICATION FEE DUE	PREV. PAID ISSUE FEE	TOTAL FEE(S) DUE	DATE DUE
nonprovisional	NO	\$1510	\$0	\$0	\$1510	07/06/2010
EXAMINER	ART UNIT	CLASS-SUBCLASS				
SWOPE, SHERIDAN		1652	435-194000			

1. Change of correspondence address or indication of "Fee Address" (37 CFR 1.363).

Change of correspondence address (or Change of Correspondence Address form PTO/SB/122) attached.  
 "Fee Address" indication (or "Fee Address" Indication form PTO/SB/47; Rev 03-02 or more recent) attached. **Use of a Customer Number is required.**

2. For printing on the patent front page, list

(1) the names of up to 3 registered patent attorneys or agents OR, alternatively,  
(2) the name of a single firm (having as a member a registered attorney or agent) and the names of up to 2 registered patent attorneys or agents. If no name is listed, no name will be printed.

1 \_\_\_\_\_  
2 \_\_\_\_\_  
3 \_\_\_\_\_

3. ASSIGNEE NAME AND RESIDENCE DATA TO BE PRINTED ON THE PATENT (print or type)

PLEASE NOTE: Unless an assignee is identified below, no assignee data will appear on the patent. If an assignee is identified below, the document has been filed for recordation as set forth in 37 CFR 3.11. Completion of this form is NOT a substitute for filing an assignment.

(A) NAME OF ASSIGNEE

(B) RESIDENCE: (CITY and STATE OR COUNTRY)

Please check the appropriate assignee category or categories (will not be printed on the patent):  Individual  Corporation or other private group entity  Government

4a. The following fee(s) are submitted:

Issue Fee  
 Publication Fee (No small entity discount permitted)  
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4b. Payment of Fee(s): (Please first reapply any previously paid issue fee shown above)

A check is enclosed.  
 Payment by credit card. Form PTO-2038 is attached.  
 The Director is hereby authorized to charge the required fee(s), any deficiency, or credit any overpayment, to Deposit Account Number \_\_\_\_\_ (enclose an extra copy of this form).

5. Change in Entity Status (from status indicated above)

a. Applicant claims SMALL ENTITY status. See 37 CFR 1.27.  b. Applicant is no longer claiming SMALL ENTITY status. See 37 CFR 1.27(g)(2).

NOTE: The Issue Fee and Publication Fee (if required) will not be accepted from anyone other than the applicant; a registered attorney or agent; or the assignee or other party in interest as shown by the records of the United States Patent and Trademark Office.

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Date \_\_\_\_\_

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This collection of information is required by 37 CFR 1.311. The information is required to obtain or retain a benefit by the public which is to file (and by the USPTO to process) an application. Confidentiality is governed by 35 U.S.C. 122 and 37 CFR 1.14. This collection is estimated to take 12 minutes to complete, including gathering, preparing, and submitting the completed application form to the USPTO. Time will vary depending upon the individual case. Any comments on the amount of time you require to complete this form and/or suggestions for reducing this burden, should be sent to the Chief Information Officer, U.S. Patent and Trademark Office, U.S. Department of Commerce, P.O. Box 1450, Alexandria, Virginia 22313-1450. DO NOT SEND FEES OR COMPLETED FORMS TO THIS ADDRESS. SEND TO: Commissioner for Patents, P.O. Box 1450, Alexandria, Virginia 22313-1450.

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10/580,458	05/24/2006	William Vainchenker	065691-0445	1466	
22428	7590	04/06/2010	EXAMINER		
SWOPE, SHERIDAN				ART UNIT	
1652				PAPER NUMBER	
DATE MAILED: 04/06/2010					

## Determination of Patent Term Adjustment under 35 U.S.C. 154 (b)

(application filed on or after May 29, 2000)

The Patent Term Adjustment to date is 38 day(s). If the issue fee is paid on the date that is three months after the mailing date of this notice and the patent issues on the Tuesday before the date that is 28 weeks (six and a half months) after the mailing date of this notice, the Patent Term Adjustment will be 38 day(s).

If a Continued Prosecution Application (CPA) was filed in the above-identified application, the filing date that determines Patent Term Adjustment is the filing date of the most recent CPA.

Applicant will be able to obtain more detailed information by accessing the Patent Application Information Retrieval (PAIR) WEB site (<http://pair.uspto.gov>).

Any questions regarding the Patent Term Extension or Adjustment determination should be directed to the Office of Patent Legal Administration at (571)-272-7702. Questions relating to issue and publication fee payments should be directed to the Customer Service Center of the Office of Patent Publication at 1-(888)-786-0101 or (571)-272-4200.

<b>Notice of Allowability</b>	<b>Application No.</b>	<b>Applicant(s)</b>	
	10/580,458	VAINCHENKER ET AL.	
	<b>Examiner</b>	<b>Art Unit</b>	
	SHERIDAN SWOPE	1652	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address--

All claims being allowable, PROSECUTION ON THE MERITS IS (OR REMAINS) CLOSED in this application. If not included herewith (or previously mailed), a Notice of Allowance (PTOL-85) or other appropriate communication will be mailed in due course. **THIS NOTICE OF ALLOWABILITY IS NOT A GRANT OF PATENT RIGHTS.** This application is subject to withdrawal from issue at the initiative of the Office or upon petition by the applicant. See 37 CFR 1.313 and MPEP 1308.

1.  This communication is responsive to October 15 and November 13, 2009.
2.  The allowed claim(s) is/are 1-4,8,9,24-26,29,31 and 42-46.
3.  Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
  - a)  All    b)  Some\*    c)  None    of the:
    1.  Certified copies of the priority documents have been received.
    2.  Certified copies of the priority documents have been received in Application No. \_\_\_\_\_.
    3.  Copies of the certified copies of the priority documents have been received in this national stage application from the International Bureau (PCT Rule 17.2(a)).

\* Certified copies not received: \_\_\_\_\_.

Applicant has THREE MONTHS FROM THE "MAILING DATE" of this communication to file a reply complying with the requirements noted below. Failure to timely comply will result in ABANDONMENT of this application.

**THIS THREE-MONTH PERIOD IS NOT EXTENDABLE.**

4.  A SUBSTITUTE OATH OR DECLARATION must be submitted. Note the attached EXAMINER'S AMENDMENT or NOTICE OF INFORMAL PATENT APPLICATION (PTO-152) which gives reason(s) why the oath or declaration is deficient.
5.  CORRECTED DRAWINGS ( as "replacement sheets") must be submitted.
  - (a)  including changes required by the Notice of Draftsperson's Patent Drawing Review ( PTO-948) attached
    - 1)  hereto or 2)  to Paper No./Mail Date \_\_\_\_\_.
  - (b)  including changes required by the attached Examiner's Amendment / Comment or in the Office action of Paper No./Mail Date \_\_\_\_\_.

Identifying indicia such as the application number (see 37 CFR 1.84(c)) should be written on the drawings in the front (not the back) of each sheet. Replacement sheet(s) should be labeled as such in the header according to 37 CFR 1.121(d).
6.  DEPOSIT OF and/or INFORMATION about the deposit of BIOLOGICAL MATERIAL must be submitted. Note the attached Examiner's comment regarding REQUIREMENT FOR THE DEPOSIT OF BIOLOGICAL MATERIAL.

**Attachment(s)**

1.  Notice of References Cited (PTO-892)
2.  Notice of Draftsperson's Patent Drawing Review (PTO-948)
3.  Information Disclosure Statements (PTO/SB/08),  
Paper No./Mail Date 0310
4.  Examiner's Comment Regarding Requirement for Deposit  
of Biological Material
5.  Notice of Informal Patent Application
6.  Interview Summary (PTO-413),  
Paper No./Mail Date \_\_\_\_\_.
7.  Examiner's Amendment/Comment
8.  Examiner's Statement of Reasons for Allowance
9.  Other \_\_\_\_\_.

/SHERIDAN SWOPE/  
Primary Examiner, Art Unit 1652

## **DETAILED ACTION**

Applicants' Request for Continued Examination of October 15, 2009 and further amendment of November 13, 2009, in response to the Action on the Merits of this case mailed April 20, 2009, are acknowledged. It is acknowledged that Claims 1, 2, 4, 8, 9, 24-26, 29-31, and 42 have been amended. Claims 1-27 and 29-42 are pending. Claims 5-7, 10-23, 27, and 32-41 were withdrawn from further consideration pursuant to 37 CFR 1.142(b). Claims 1-4, 8, 9, 24-26, 29-31, and 42 are hereby reexamined.

### ***Examiner's Amendment***

An examiner's amendment to the record appears below. Should the changes and/or additions be unacceptable to Applicant, an amendment may be filed as provided by 37 CFR 1.312. To ensure consideration of such an amendment, it MUST be submitted no later than the payment of the issue fee.

### ***Specification***

Replace the title to Figure 1, page 26-line 16, with:

- -Figure 1: Discovery of the key role of JAK2 in the Epo receptor.-

### ***Claims***

Cancel Claims 5-7, 10-23, 27, 30, and 32-41

Replace Claims 8, 9, 24, 25, and 29 with the following.

-8. An isolated nucleic acid consisting essentially of at least 12 consecutive nucleotides of sequence SEQ ID NO 3 or 4, wherein the isolated nucleic acid comprises the nucleotide t<sup>261</sup> in SEQ ID NO 3 or t<sup>50</sup> in SEQ ID NO 4, wherein the isolated nucleic acid has the functional properties of a probe or primer.-

-9. The isolated nucleic acid according to claim 8, wherein  
said isolated nucleic acid is SEQ ID NO: 11 with a g<sup>21</sup>t mutation.-

-24. A kit for detecting a G<sup>1849</sup>T mutation in the human JAK2 gene in a human tumor,  
wherein the kit comprises one or more primers or probes, as defined in claim 8, for the specific  
detection of the presence or absence of the G<sup>1849</sup>T mutation in the human JAK2 gene, wherein  
the G<sup>1849</sup>T mutation is nucleotide t<sup>261</sup> in SEQ ID NO 3 or t<sup>50</sup> in SEQ ID NO 4.-

- 25. A kit for determining whether a patient is suffering from a myeloproliferative  
disorder involving a G<sup>1849</sup>T mutation of the human JAK2 gene, wherein the kit comprise one or  
more probes or primers, as defined in claim 8, for the specific detection of the presence or  
absence of the G<sup>1849</sup>T mutation in the human JAK2 gene.-

- 29. An isolated siRNA capable of reducing, by more than 50%, the expression of the  
variant of human JAK2 protein according to claim 1 in an isolated cell system, wherein the  
siRNA is 19 to 25 nucleotides in length, with the sequence of a first strand being identical and  
the sequence of a second strand being complementary to sequence (i) SEQ ID NO 3, (ii) SEQ ID  
NO 4, or (iii) SEQ ID NO 11 with a g<sup>21</sup>t mutation.-

Add Claim 43-46 as follows:

43. The isolated nucleic acid according to claim 8, wherein said nucleic acid consists  
essentially of 15 to 30 consecutive nucleotides of sequence SEQ ID NO 3 or 4, wherein the  
nucleic acid comprises the nucleotide t<sup>261</sup> in SEQ ID NO 3 or t<sup>50</sup> in SEQ ID NO 4.

44. The isolated nucleic acid according to claim 8, wherein said nucleic acid consists  
essentially of at least 15 consecutive nucleotides.

45. The isolated nucleic acid according to claim 8, wherein said nucleic acid consists of at least 12 consecutive nucleotides.

46. The isolated nucleic acid according to claim 8, wherein said nucleic acid consists of at least 15 consecutive nucleotides.

Authorization for this examiner's amendment was given by Rouget Henschel on March 29, 2010.

***Allowable Subject Matter***

Claims 1-4, 8, 9, 24-26, 29, 31, and 42-46 are allowed.

The following is an examiner's statement of reasons for allowance.

All allowable claims, Claims 1-4, 8, 9, 24-26, 29, 31, and 42-46, are limited to an isolated variant of human JAK2 kinase having a V<sup>617</sup>F mutation, as set forth by SEQ ID NO: 2, isolated encoding nucleic acid molecules, vectors, host cells, methods of making the encoded protein, probes and primers for identifying the V<sup>617</sup>F mutation, and siRNA for inhibiting expression of the encoding polynucleotide. The utility of the recited polypeptides and polynucleotides is based on, for example, 90% of Polycythemia Vera patients tested (39/43) having the JAK2 kinase V<sup>617</sup>F mutation (Example 1). Thus, the recited polypeptides and polynucleotides have real-world use in, at least, diagnosis and further study of Polycythemia Vera.

***Priority***

The priority date granted for the allowable claims, Claims 1-4, 8, 9, 24-26, 29, 31, 42, and 43, is October 27, 2004, the filing date of FRANCE 0411480, which disclosed the recited subject matter.

Any comments considered necessary by applicant must be submitted no later than the payment of the issue fee and, to avoid processing delays, should preferably accompany the issue fee. Such submissions should be clearly labeled "Comments on Statement of Reasons for Allowance."

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Sheridan L. Swope whose telephone number is 571-272-0943. The examiner can normally be reached on M-F; 9:30-7 EST.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Andrew Wang, can be reached on 571-272-0811. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published application may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on the access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).

/SHERIDAN SWOPE/  
Primary Examiner, Art Unit 1652